

**Influence of the Wall Thickness of the Mould on the Solidification and Quality of a Steel Ingot.** I. Ya. Granat and A. A. Bezdenezhnykh. (Metallurg, 1938, No. 10, pp. 19-33). (In Russian). Prior to the study of the solidification of 7-ton ingots with the object of improving the mould design, the authors studied the effect of mould-wall thickness on the solidification process. For this purpose a vertical circular mould (with internal diameter varying from 630 mm. to 920 mm. and height 2300 mm.) was used, a wall thickness varying from 240 to 80 mm. being obtained by the out-of-centre position of the cylindrical interior. The rate of cooling of the steel near the 240- and 80 mm.-thick mould walls was studied by temperature measurements, by means of suitably protected platinum/platinum-rhodium thermocouples which had been passed through the walls and made to protrude 3 cm. into the interior. Calculations based on the cooling curves obtained showed that during solidification the thin wall removed more heat from the molten metal than did the thick mould wall. This was also confirmed by examination of the structure of the ingot. The process of solidification in the 7-ton industrial rectangular ingot mould was studied by temperature measurements by means of thermocouples let into the walls at different levels. Curves showing temperature distributions in the mould walls and heat losses from various parts of the mould, as solidification progressed, were obtained. Defects, in particular piping, of the ingots was traced to incorrect mould design. The design should provide an increase in wall thickness from bottom to top with no, or only a minimum, taper in the same direction.

GRANAT, I. YA.

PA 41117

USSR/Engineering  
Foundry Practice  
Casting

Feb 1948

"Development and Present Day Status of Continuous Casting of Metals," I. Ya. Granat, Candidate Tech Sci, V. M. Tageyev, Engr, 7 pp

"Stal'" No 2

In spite of the great engineering, technologic, and economic advantages of continuous casting of steel parts, the basic method of conducting continuous casting--with a moving and stationary crystallizer--cannot be said to be sufficiently developed for efficient industrial use. It is important and necessary to intensify experimental work in this field.

FDB

41T17

SAMARIN, A.M.; YEFIMOV, L.M.; VESHIKOV, N.G.; ORMAN, R.Z.; SHABANOV, A.N.;  
MOROZHENSKIY, L.I.; GRANAT, I.Ya.; TOCHINSKIY, A.S.; ALYAVDIN, V.A.;  
DANILOV, P.M.; PETRIKEYEV, V.I.; POPOV, B.N.; BOBKOV, T.M.;  
ROSTKOVSKIY, S.Ye.; GAVRISH, D.I.; D'YAKONOV, N.S.; TIMOSHPOL'SKIY,  
M.M.; ROMANOV, V.D.; POCHTMAN, A.M.; MELESHKO, A.M.; PODGORETSKIY,  
A.A.; OFENGENDEN, A.M.; BRONSHTEYN, V.M.; PRIDANTSEV, M.V.; LIVSHITS,  
G.L.; ROZHKOVA, V.A.; RUTES, V.S.

Reports (brief annotations). Biul. TSNIICM no.18/19:15-16 '57.

(MIRA 11:4)

1. Chlen-korrespondent AN SSSR (for Samarin).
2. Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii (for Rutes, Rostkovskiy, Pridantsev, Livshits, Rozhkov).
3. Stal'proyekt (for Shabanov).
4. Kuznetskiy metallurgicheskiy kombinat (for Alavadin, Danilov, Petrikeyev).
5. Zavod "Elektrostal'" (for Popov).
6. "Dnepropetstal'" (for Bobkov).
7. Glavogneupor Ministerstva chernoy metallurgii SSSR (for Gavrish).
8. Planovoye upravleniye Ministerstva chernoy metallurgii SSSR (for D'yakonov).
9. Otdel rabochikh kadrov, truda i zarplaty Ministerstva chernoy metallurgii SSSR (for Timoshpol'skiy).
10. Glavvtorchernet Ministerstva chernoy metallurgii SSSR (for Romanov).
11. Giprostal' (for Pochtman).
12. Zavod im. Voroshilova (for Meleshko).
13. Zavod "Zaporozhstal'" (for Podgoretskiy).
14. Stalinskiy metallurgicheskiy zavod (for Ofengenden).
15. Nizhne-Tagil'skiy metallurgicheskiy kombinat (for Bronshteyn).

(Steel--Metallurgy)

137-58-6-11845

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 6, p 95 (USSR)

AUTHORS: Morozenskiy, L.I., Granat, I.Ya., Tochinskiy, A.S.

TITLE: Continuous Casting of Steel (Nepreryvnaya razlivka stali)

PERIODICAL: Tr. Nauchno-tekhn. o-va chernoy metallurgii, 1957, Vol 18, pp 95-101

ABSTRACT: Three methods of continuous casting of steel are examined. One is characterized by the fact that the level of the metal in the crystallizer (K) changes periodically as the result of periodic changes in the rate of withdrawal of the billet (B) or the rate at which the metal is poured. This principle is employed in an experimental pilot plant with inclined K for pouring B measuring 250x250 mm. Over 8000 tons of B have been cast on this equipment. The casting rate is  $\sim 400$  kg/min. The yield of passable cast B is 92-95% of the weight of the molten steel, and the yield of passable rolled product is 86-90% of the weight of the cast B. The second method is characterized by the fact that after filling the K with metal to the given level, the flow of metal is cut off and the stage of B coming into being is held in the K for a firm rim to form. Then the K is opened, and the B

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137-58-6-11845

### Continuous Casting of Steel

is lowered so that its upper portion serves as a floor for the next filling. The K halves are closed, and the next load of metal is poured. Multiple repetition of this cycle builds up the B step by step. In practice, casting is done in two K, metal being poured into one while the other is held. B of 270x270 cross section are cast in an experimental vertical pilot plant with two K built on the foregoing principle. Over 12,000 t of B have been thus cast. The yield of good cast B is 96-92% of the weight of the molten steel, and the yield of good rolled product is 88-92% of the weight of the cast B. The third method, continuous multisection bottom pouring, is designed to cast B of small cross section from large capacity ladles. The metal is poured from above into one of the parallel sections of the K; the others receive it by siphon from the first through channels connecting the sections. An experimental 5-section plant for casting B of 115x115 mm at 25-30 t/hr has been built on this principle.

N.N.

1. Steel--Casting
2. Steel--Processing
3. Industrial plants--Equipment

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*G RANAT, I. Ya.*

137-1958-2-2489

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 2, p 43 (USSR)

AUTHORS: Morozenskiy, L.I., Zitel', O.D., Granat, I. Ya.

TITLE: Phenomena Discovered With Radioactive Tracers During a Study of the Solidification Process in Steel Ingots (Yavleniya, obnaruzhennyye metodom radioaktivnykh indikatorov pri issledovanii zatverdevaniya stal'nykh slitkov)

PERIODICAL: V sb.: Fiz.-khim. osnovy proiz-va stali. Moscow, AN SSSR, 1957, pp 765-780. Diskus., pp 781-791

ABSTRACT: A study was made of the phenomenon of the displacement of metal during solidification of an ingot and of what causes it. Experiments were conducted on ingots with a large N/D value with the aid of the radioactive isotopes S<sup>35</sup>, P<sup>32</sup>, and W<sup>185</sup>, which had first been dissolved in molten metal and then were poured into either the upper or the lower part of the ingot. The distribution of the isotope was determined by autoradiography of longitudinal templets of the ingots under study. The steel used in the experiments was 30KhNZA, which had been cast into vertical ingots measuring 270x270x2600 mm, and steel 45 in ingots 250x250x4000 mm, which were cast in an inclined mold. It became evident

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137-1958-2-2489

**Phenomena Discovered With Radioactive Tracers (cont.)**

that the tracers were not evenly distributed throughout the ingots, that instead they formed alternating bands which were parallel to the crystallization front. On a sulfur print these bands did not show up. The dispersion of the tracers occurred only in a downward direction and at great speeds, which reached 20 m/min. These phenomena resulted neither from an isotope exchange nor from convection currents, but were attributed to a shrinkage of the metal at the moment it crystallizes. According to this hypothesis the currents in the molten metal caused by the shrinkage develop most fully only at those sections of the crystallization front at which the vertical component of the hydrostatic pressure of the metal on the sides is either an upward one or equals zero. The greater the coefficient of shrinkage, the N/D ratio, and the crystallization rate, the greater will be the speed of the flow. The motion exhibited by the metal was linked to the structure of the ingot which was characterized by the fact that the orientation of the secondary axes of the dendrites in the half-section adjoining the upper face of the inclined ingot coincided with the direction of the currents, notwithstanding the orientation of the primary axes. Moreover, in the inclined ingot the macrostructure was asymmetrical; this also was accounted for by the action of the currents in the ingot metal, which were moving

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137-1958-2-2489

Phenomena Discovered With Radioactive Tracers (cont.)

at different speeds along the top and bottom faces of the ingot. The currents in the metal, which descend near the crystallization front, could be one of the causes of the extra-axial chemical heterogeneity (the "branches") which develop. The foregoing hypothesis tends to support the position which holds that, as the angle of taper of ingots which broaden upward increases, the "branches" show up less sharply, for this corresponds to the reduced flow of metal along the crystallization front.

V.N.

1. ~~Steel--Solidification~~    2. ~~Steel--Displacement--Theory~~

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SOV/137-58-9-18689

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 9, p 78 (USSR)

AUTHORS: Zigel', O.D., Morozenskiy, L.I., Granat, I.Ya.

TITLE: Factors Governing the Appearance of Extra-axial Chemical Inhomogeneity in Steel Ingots (Faktory, opredelyayushchiye razvitiye v stal'nykh slitkakh vneosevoy khimicheskoy neodnorodnosti)

PERIODICAL: V sb.: Staleplavil'n proiz-vo. Moscow, Metallurgizdat, 1958, pp 75-88

ABSTRACT: A study of the process of ingot formation was first conducted with billets of high height-to-cross-section ratio produced by continuous casting of steel.  $P^{32}$ ,  $W^{185}$ , and  $S^{35}$  were introduced into the metal in the tundish. Macroscopic radiography of templets showed the isotopes to be in layers parallel to the plane of crystallization of the metal, the dissemination thereof into the ingot proceeding downwards at a rate of 10 m/min under the conditions of the experiment. This distribution of the isotope reveals the cause of its dissemination into the ingot to be primarily transfer by streams of liquid metal, the movement of which is induced, in the crystallization of an ingot

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SOV/137-58-9-18689

**Factors Governing the Appearance of Extra-axial Chemical (cont.)**

of killed steel, primarily by shrinkage upon transition from the liquid to the solid state. Metal containing  $W^{185}$  was added to in sand molds of various shapes after they had been filled. It was found that the radioactive tracer enters the casting in flows of metal along the front of crystallization at a rate considerably greater than the rate of motion of the metal in the rest of the liquid mass. The direction of displacement of the metal in the casting is not determined either by the temperature distribution in the casting or by the temperature of the metal in the incoming flow. The angle to the horizontal of segments of the front of crystallization has a significant effect upon the formation of longitudinal flows along the front. The influence of displacements of metal along the front of crystallization upon the degree of extra-axial chemical inhomogeneity was verified by loam casting of a 1.5-t ingot the sides of which had tapers of 30, 20, 5, and 0%. The appearance of "whiskers" adjacent to the vertical edge was noticeably more intensive than near the edges with 30% taper. The intensity of the metal flows along the front of crystallization depends upon the rate of solidification. Zonal inhomogeneity may occur only where the rate of crystallization is capable of giving rise to an intensified flow of metal along the front, and the formation of a region where 2 phases exist simultaneously. This explains the formation of pronounced inhomogeneities in the hot top of an ingot and the absence

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Factors Governing the Appearance of Extra-axial Chemical (cont.)

thereof toward the bottom. The differences in the chemical composition of the steel affect the intensity of "whisker" development because they result in different degrees of shrinkage of the metal.

L.K.

1. Steel--Processing
2. Steel--Crystallization
3. Steel--Structural analysis
4. Radioisotopes--Diffusion
5. Steel--Radiographic analysis

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SOV/123-59-15-60472

Translation from: Referativnyy zhurnal. Mashinostroyeniye, 1959, Nr 15, pp 223 - 224 (USSR)

AUTHORS: Zigel', O.D., Morozenskiy, L.I., Granat, I.Ya.

TITLE: Factors Determining the Development of Non-Axial Chemical and Structural Heterogeneity in Steel Bars and Castings

PERIODICAL: V sb.: Zatverdevaniye metallov. Moscow, Mashgiz, 1958, pp 338 - 351

ABSTRACT: In order to elucidate the causes of the development of non-axial heterogeneity tests were carried out with steel bars of continuous casting with a cross-section of 250 · 250 and 270 · 270 mm, which were cast in vertical and inclined position (at an angle of 30° with respect to the horizon), and with steel castings of various configuration produced in sand molds. During the crystallization period of the bars and castings, steel containing the radioactive isotopes P<sup>32</sup>, W<sup>185</sup> or S<sup>35</sup> was added. The radiograms obtained permitted to determine the parts of diffusion within the bulk of the casting, of this steel which compensated the solidification shrinkage. It was found out that the steel supplied formed flows near the crystallization front, which almost did not reach the central zone of the liquid metal. The most

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SOV/123-59-15-60472

Factors Determining the Development of Non-Axial Chemical and Structural Heterogeneity in Steel Bars and Castings

intensive flows occurred near those sections of the crystallization front which are located horizontally above the liquid metal or vertically, where the vertical component of hydrostatic pressure is directed upwards or equal to zero. Near the front sections located horizontally below the liquid metal, e.g. in the bottom part of the bar, the flows were developed weakly or did not appear at all; here the supply takes place mainly at the expense of the above-located layer of metal. The flow intensity near the inclined sections may have a number of intermediate values, depending on the angle and direction of inclination. For instance the flow intensity is greater in bars growing wider at the bottom than in bars with vertical walls, and smaller in bars growing in width at the upper part. In both cases the difference is the more considerable, the more slanting the walls are. Also the extension of the crystallization front affects the flow intensity. On the basis of the comparison of the data obtained on the flow direction of the metal supply with the actual data on the location of dendritic heterogeneity ("whisker") in bars of bubble-free steel, it can be concluded that these flows are the causes of the appearance of "whiskers". Another necessary condition for the formation of whiskers is the existence of a zone of solid-liquid metal. At a high solidification rate this zone does not develop, therefore "whiskers" are not formed.

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Factors Determining the Development of Non-Axial Chemical and Structural Heterogeneity in Steel Bars and Castings

At too low cooling rates "whiskers" might not form either, in spite of the presence of a developed zone of solid-liquid metal, since in this case the flow intensity is considerably reduced. Effects of the flows on the character of the structure were also discovered. In bars of continuous casting, crystallized in an inclined position at an angle of  $30^\circ$  relative to the horizon, at the upper face, where the flows develop most strongly, longer columnar crystals were formed than at the lower face, in consequence of the heating effect of the flows. In the zone of increased development of flows the direction of the dendritic axes of the second order coincides with the direction of the flows and does not depend on the direction of the axis of the first order. 10 figures.

O.S.M.

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ZHURAVLEV, P.Ya.; EFROS, D.I.; KUTENKO, Yu.V.; POKROVSKIY, V.A.; GRANAT,  
I.Ya.; MOROZENSKIY, L.I.; GORSKIY, V.B.

Influence of vacuum treatment and the conditions of steel  
deoxidation on the formation of surface defects in continuous  
ingots. Stal' 25 no.10:891-894 0 '65.

1. Gor'kovskiy mashinostroitel'nyy zavod.

(MIRA 18:11)

L 30059-66 EWP(w)/EWP(v)/EWP(k) IJP(c) WW/EM  
ACC NR: AP6020590 SOURCE CODE: CZ/0026/66/011/001/0063/0066

AUTHOR: Granat, Ludek (Prague)

ORG: Research Institute of Mathematical Machinery, Prague (Vyzkumny ustav  
matematickych stroju) 27  
B

TITLE: Note on the article of M. Kuniak: graphic determination of the characteristics  
of the helical surfaces of a casing 26

SOURCE: Aplikace matematiky, v. 11, no. 1, 1966, 63-66

TOPIC TAGS: construction, graphic technique, solid geometry

ABSTRACT: A conoid formed by normals constructed at points of the characteristics  
of an enveloping helical surface to the generating surface of a cylinder of rotation  
is a hyperbolic paraboloid. The characteristic of the enveloping helical surface  
can also be constructed as the line of intersection of the generating surface and  
the hyperbolic paraboloid when the generating surface is a second-order surface of  
rotation. The characteristic of the enveloping helical surface, where the generating  
surface is a torus, is an eighth-order curve when can be determined with the two  
equations derived in the article. Orig. art. has: 6 formulas. [JPRS]

SUB CODE: 12/ SUBM DATE: 02Apr65/ ORIG REF: C01/ SOV REF: 001

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L 10611-66 EWT(d) IJP(c)

ACC. NR. AP6004058

SOURCE CODE: CZ/0081/65/090/002/0194/0199

AUTHOR: Granat, Ludek (Prague)

29

ORG.: none

TITLE: <sup>16,44,55</sup>  
p-Projection of a straight line on a surface

SOURCE: Casopis pro pestovani matematiky, v. 90, no. 2, 1965, 194-199

TOPIC TAGS: construction, projective geometry, surface geometry, analytic geometry

ABSTRACT: The article demonstrates a method of analytical construction of the theory of p-projections of a straight line on a surface and derives additional relations which can be used in graphic constructions. Orig. art. has: 10 formulas. [JPRS]

SUB CODE: 12 / SUBM DATE: 02Apr64 / ORIG REF: 001 / OTH REF: 001 / SOV REF: 001

jc

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GRANAT, L. N., starshiy nauchnyy sotrudnik

Prevention of incipient puerperal mastitis. Akush. i gin. no.2:  
29-33 '62. (MIRA 15:6)

1. Iz 2-go akusherskogo otdeleniya (zav. - prof. S. G. Khaskin)  
Instituta akusherstva i ginekologii (dir. - chlen-korrespondent  
AMN SSSR prof. P. A. Beloshapko[deceased]) AMN SSSR.

(BREAST—DISEASES) (PUERPERIUM)

GRANAT, L.N.

Puerperal mastitis and its clinical course under conditions of mass immunization with staphylococcal anatoxin; from data of obstetrical and surgical hospitals and polyclinics in Leningrad. Akush. i gin. 40 no.1:25-27 Ja-F '64.

(MIRA 17:8)  
1. 2-ye akusherskoye otdeleniye (zav. - prof. S.G. Khaskin)  
Instituta akusherstva i ginekologii AMN SSSR (dir. - prof. M.A. Petrov-Maslakov), Leningrad.

GRANAT, L.N.; MOSKALENKO, Yu.Ye.

Changes in the hemodynamics in the female breast under the effect of heat and cold stimulation. Fiziol. zhur. 51 no.9:1100-1107 S '65.  
(MIRA 18:9)

1. Institut akusherstva i ginekologii AN SSSR i Institut evolyutsionnoy fiziologii i biokhimii imeni I.M.Sechenova AN SSSR, Leningrad.

GRANAT, L.N.; IVANOVA, V.V.; YUKHNOVSKAYA, S.Yu., red.

[For the young mother] Molodoi materi. Moskva, Meditsina,  
1965. 34 p. (MIRA 18:6)

VOZNESENDKIY, B.N.; LOGINOV, D.F. [deceased]; GRANAT, M.B.; BELIKOV, B.S.,  
redaktor; SOKOLOVA, R.Ya., tekhnicheskiy redaktor

[Album of basic circuits for combined operation of dial telephone  
exchanges with machine-switching and step-by-step systems] Pro-  
mezhutochnoe oborudovanie dlia sovmestnoi raboty ATS mashinnoi i  
shagovoi sistem. Moskva, Gos. izd-vo lit-ry po voprosam svyazi i  
radio, 1954. 187 p. [Microfilm] (MLRA 8:6)  
(Telephone, Automatic)

BORODZYUK, G.G.; STEPANOV, G.N.; DRIATSKIY, N.M.; IONTOV, L.Ye.; KOVALEV, S.M.; BLOKHIN, A.S.; DVORTSOV, L.D.; LUGOVSKOY, N.Ye.; MERKULOV, A.G.; SMIRNOV, B.P.; ROGINSKIY, E.M.; BALAN-IL'YEVSKAYA, I.A.; IZRAILIT, S.G.; GRANAT, M.B.; ZARIN, S.A.; otv.red.; FEDOROVSKAYA, L.N., red.; MARKOCH, K.G., tekhn.red.

[Multichannel apparatus for high-voltage telephony on overhead lines and cables] Mnogokanal'naya apparatura vysokochastotnogo telefonirovaniya po vozdushnym i kabel'nym liniyam svyazi. Moskva, Gos.izd-vo lit-ry po voprosam svyazi i radio, 1959. 511 p.

(MIRA 14:1)

(Telephone--Equipment and supplies)

GRANAT, N.I.

Flow of a uniformly eddying ideal liquid with imposed circulation  
past a cylinder near the wall. Izv.VNIIG 62:137-146 '59.

(MIRA 13:6)

(Hydrodynamics)



S/179/60/000/01/010/034

E031/E535

AUTHOR: Granat, N. L. (Leningrad)

TITLE: The Motion of a Rigid Body in the Pulsating Flow of a  
Viscous Fluid

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Mekhanika i mashinostroyeniye, 1960, Nr 1, pp 70-78

ABSTRACT: The steady oscillations of a sphere in a flow of fluid which is pulsating according to an arbitrary law in which the Reynolds number of the motion is small is considered. An expression is used for the force, obtained by solving the equations of motion of the fluid at Reynolds numbers of less than unity, which is a generalization of Stokes' expression for the harmonic oscillations of a body in a fluid which is undisturbed at infinity to the case of the arbitrary periodic motion of a sphere in a pulsating flow. The fluid is assumed to be homogeneous, viscous and incompressible. Consideration of flow at low Reynolds number allows the convective terms in the expression for the acceleration to be ignored. An Card 1/4 approach due to A. I. Lur'e is used to reduce the equations

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EO31/E535

The Motion of a Rigid Body in the Pulsating Flow of a Viscous Fluid

of motion to a single equation involving the function  $\underline{f}$ , where  $\text{curl } \underline{u} = \underline{f} \times \underline{r}$ , from which the velocity  $\underline{u}$  can be determined.  $\underline{f}$  is defined by a scalar differential equation. If the velocity of the pulsating flow is given in the form of a Fourier series, the velocity of the sphere will have the same form, and so the expression for  $\underline{f}$  is sought in a similar form. The coefficients in the expansion for the velocity of the sphere are determined by the equation of motion of the sphere,  $m \dot{\underline{u}} = \underline{K}$  where the force  $\underline{K}$  is calculated by applying the theorem about the change in the momentum to the volume of fluid between the sphere and a control surface. It is seen that to each harmonic component of the flow velocity there corresponds a harmonic component of the sphere velocity different from the first in amplitude and phase. By considering the ratio of the amplitudes of the components of the two velocities and their phase differences, it is seen that a sphere which is denser than

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the fluid will oscillate with amplitudes less than the amplitudes of the flow, the converse holding if the sphere is less dense than the fluid. The oscillations of the sphere which is denser than the fluid lag in phase and the converse is true for a sphere which is less dense than the fluid. The generalized Stokes' force referred to above can be used to estimate the error when the force applied to the body is given approximately as the sum of the inertial forces arising through the motion of the body in an ideal fluid and the viscous drag forces in stationary motion. The dissipation of energy caused by the relative oscillations of solid particles in a fluid is discussed, the solution derived above being used to obtain an expression for the dissipation. Next the distribution of the dissipation of energy near the sphere is considered and the dimension of the region of disturbance determined. Acknowledgment is made to M. A. Dement'yev for advice and directives.

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E031/E535

The Motion of a Rigid Body in the Pulsating Flow of a Viscous Fluid

There are 5 figures and 9 references, 5 of which are  
Soviet, 1 French and 3 English. ✓

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut  
gidrotekhniki (All Union Scientific Research Institute  
of Hydraulic Engineering)

SUBMITTED: August 8, 1959

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S/124/61/000/009/019/058  
D234/D303

AUTHOR: Granat, N.L.

TITLE: Motion of a free solid particle in a turbulent stream of liquid

PERIODICAL: Referativnyy zhurnal. Mekhanika, no. 9, 1961, 80, .  
abstract 9 B576 (Izv. vses, n.-i., in-ta gidrotekhn.,  
1960, 65, 63-75)

TEXT: The author considers the motion of a free spherical solid particle in a homogeneous unbounded pulsating stream of a viscous incompressible liquid at small values of Reynolds' number. In contrast to previous papers, neither the hypothesis of stationary character of the viscous resistance force nor Boussinesq formula are utilized here. The solution of the problem is achieved in the following manner. It is supposed that the known velocity of the undisturbed pulsating stream of liquid (at infinity)  $U_\infty$  and the unknown velocity of the particle situated in this stream  $U_s$  can be expanded

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Motion of a free solid particle...

into a Fourier series. The velocity  $U$  of the disturbed motion of the stream is expressed with the aid of the continuity equation and the equations of motion in terms of expansion coefficients of the functions  $U_w$  and  $U_s$ , after which the expression of the force  $K$  acting on the particle from the stream is easily determined in terms of the same coefficients. The substitution of the expressions of  $U_w$ ,  $U_s$ ,  $K$  into the equation of motion of the particle permits determination of the unknown coefficients of the expansion of the function  $U_s$ . Analysis of the results obtained shows that a free spherical particle in a pulsating stream of a viscous incompressible liquid acquires an average velocity equal to the average velocity of the stream, and a pulsation velocity different from the pulsation velocity of the stream. Each harmonic component of the velocity of the particle differs from the corresponding harmonic component of the velocity of the stream in amplitude as well as in phase (except the case when the density of the particle  $\rho_s$  is equal to the density of the stream  $\rho_w$ ). The ratio of corresponding amplitudes and the phase displacement are functions of two dimensionless

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parameters

$$\Delta = \frac{\rho_s}{\rho_w} \text{ and } \alpha_n = r_0 \sqrt{\frac{n\omega}{2\nu}} = \sqrt{R_n}$$

where  $r_0$  is the radius of the particle,  $\nu$  the kinematical viscosity coefficient,  $n$  the order of the harmonic in the Fourier expansion,  $\omega$  the frequency of oscillations. The oscillations of a particle of a density larger than that of the liquid ( $\Delta > 1$ ) have smaller amplitudes, and are behind the corresponding oscillations of the liquid in phase; the opposite takes place in the case  $\Delta < 1$ . The maximum phase displacement possible is  $90^\circ$ . From the values  $\alpha_n > 2$  the dependence of the phase displacement and the ratio of amplitudes on  $\alpha_n$  becomes very weak. A formula is deduced for the force  $K$  acting on a sphere in a pulsating stream which is a generalization of Stoke's formula obtained for the case of harmonic oscillations of a sphere in a liquid at rest. This formula is compared with the expression for the force  $K_0$  obtained with the use

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S/124/61/000/009/019/058  
D234/D303

of the hypothesis of stationary motion. It is shown that the difference  $K - K_c$  (i.e. the force not taken into account by the hypothesis of stationary motion) depends essentially on  $\alpha_n$  and  $\Delta$ . The ratio of the amplitudes of corresponding harmonics of the unaccounted force  $K - K_c$  and the total force of  $K$  (which characterizes the error caused by the hypothesis of stationary motion) reaches its maximum value (0.551) at  $\alpha_n = 1.225$  and  $\Delta = \infty$ . For  $\alpha_n > 15$  the hypothesis of stationary motion leads to a very small error.  
[ Abstracter's note: Complete translation ]

Card 4/4



GRANAT, N.L. (Leningrad)

Turbulences produced by a body moving in a viscous fluid. Izv.  
AN SSSR Otd. tekhn. nauk. Mekh. i mashinostr. no. 1:86-89 Ja-F '61.  
(MIRA 14:2)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut gidrotekhniki.  
(Turbulence) (Fluid dynamics)

GRANAT, N.I., *kand. fiziko-matem. nauk*

Considerable oscillations of a sphere in a viscous fluid. Izv. VNIIG  
76:289-298 '64. (MIRA 18:10)

EWB(τ)/EW(ε)/EWP(k)/EWT(d)/EWT(l)/EWT(π)/EWS(k)/EWA(d)/EWP(w)

EN 84

mat, N. L. (Leningrad)

Loss of sphere oscillations in a two-phase mixture (vibro-viscosity and vibro-density)

SOURCE: AN SSSR. Izvestiya. Mekhanika, no. 1, 1965, 34-41

TOPIC TAGS: viscous flow, viscosity, two phase flow, drag coefficient, vibration, energy dissipation

Effect of viscosity and density of a liquid-solid mixture were investigated in the case of a sphere oscillating in a liquid.

Viscosity in the liquid with a low Reynolds number is taken into account. A sphere is assumed to consist of the sum of two parts: a loss of energy at the same speed with the surrounding liquid, and a loss of energy at the same speed with the surrounding liquid, and a loss of energy at the same speed with the surrounding liquid.

liquid. From the equations of motion for the whole system, the following effective density expression is obtained for the two-phase mixture

Card 1/3

49289-65

ACCESSION NR: AP5010184

$$\rho^* = 1 + s(\lambda_1 - 1) \left[ 1 - \frac{\lambda_1 - 1}{\lambda_1 + 1} \left( \lambda_1 + \frac{1}{2} + \frac{9}{4\lambda_1} \right) \right] \quad x = \frac{9}{4\lambda_1}$$

$$\lambda_1 \lambda_2 = \lambda_1^2 + \lambda_2^2 + \frac{9}{4\lambda_1} + \frac{1}{4} + \frac{81}{4\lambda_1^2} (1 - 2x - 2x^2 + \frac{4}{3} x^3) \quad x = \frac{9}{4\lambda_1}$$

the effective viscosity  $\eta_{eff}$  of the mixture as a function of the concentration in the mixture  $\lambda_1$ ,  $\lambda_2$  and  $\lambda_3$ . The effective viscosity  $\eta_{eff}$  is defined as the ratio of the energy losses  $D_1$  and  $D_2$  yields the result:

$$D^* = D_1 + D_2 = 3\pi\mu R_0 A_2^2 \left[ (1 + x)(1 + 2.5s) + \frac{9}{4} \left( \frac{R_0}{r_0} \right)^2 s(1 + x)(\lambda_1 - 1)^2 (1 + x_1) \right] \cdot$$

The expression for the effective mixture viscosity is given by

$$\eta_{eff} = \frac{9}{4} \frac{R_0^2}{r_0^2} \frac{(1 + x)(1 + 2.5s) + \frac{9}{4} \left( \frac{R_0}{r_0} \right)^2 s(1 + x)(\lambda_1 - 1)^2 (1 + x_1)}{\lambda_1^2 + \lambda_2^2 + \frac{9}{4\lambda_1} + \frac{1}{4} + \frac{81}{4\lambda_1^2} (1 - 2x - 2x^2 + \frac{4}{3} x^3)}$$

It is concluded that the effective mixture viscosity increases with the concentration of the particles in the mixture.

The effective mixture viscosity  $\eta_{eff}$  is a function of the concentration of the particles in the mixture  $\lambda_1$ ,  $\lambda_2$  and  $\lambda_3$ . The effective viscosity  $\eta_{eff}$  is defined as the ratio of the energy losses  $D_1$  and  $D_2$  yields the result:

ASSOCIATION: none

Card 2/3

EWB(m)/EWT(1)/EPR/EWA(d)EWA(1)/ P1-1/P1-1/Ps-1 AEDC(c)/SSD/AFWL/

AF500-23

0001/0001

AUTHOR: Granat, N. L. (Leningrad)

TITLE: Steady-state oscillations of a container with a two-phase mixture

SOURCE: AN SSSR. Izvestiya. Mekhanika i mashinostroyeniye, no. 5, 1964, 61-64

TOPIC TAGS: two phase flow, incompressible flow, solid phase, viscous fluid flow, vibration, friction force

ABSTRACT: The force and energy required to maintain given steady-state oscillations in a two-phase mixture were calculated, using previous results on motion of solid particles in pulsating, viscous, incompressible liquids. The container is assumed to have a volume  $V$  and to contain a small amount of spherical solid particles (of concentration  $s$ ) homogeneous in distribution in a liquid medium. A linear, steady, harmonic motion is applied to the system,  $u = A \sin \omega t$ , and the equation of motion of the system is given by

$$\ddot{P} = m\ddot{u} + \rho V s (\Delta - 1) \dot{u} \quad (\Delta = \rho_0 / \rho) \quad \text{where} \quad m = m_0 + \rho V [1 + s(\Delta - 1)]$$

is the mass of container plus mixture. Here  $\omega$  is determined from viscous flow

Card 1/2

L 22169-65

ACCESSION NR: AP5002593

analyses of solid particles in a pulsating fluid given by N. L. Granat (Dvizheniye tverdogo tela v pul'siruyushchem potoke vyazkoy zhidkosti. Izv. AN SSSR, OTN, Mekhanika i mashinostroyeniye, No. 1, 1960; and Nemalye kolebaniya shara v vyazkoy zhidkosti. Izv. VNIIG, t. 76, 1964), both for oscillation amplitudes small and large relative to particle dimensions. Next,  $\omega$  is shown to be a function of  $\Delta$  (relative density of solid particles) and  $\alpha = \frac{1}{\sqrt{1 + \frac{1}{\Delta^2}}}$ . A numerical example is given for a water-magnetite mixture,  $s = 1.5$ ,  $\omega = 50 \text{ sec}^{-1}$  and  $A = 3 \text{ mm}$ . The result shows that the amplitude of the perturbation force is

$$B = A \sqrt{\omega^2 (k + k_0)^2 + (c - m \omega^2)^2},$$

where  $k$  is a reduced drag coefficient, is forty times lower than the magnitude one would obtain by assuming no relative motion between the solid particles and the container. Orig. art. has: 13 equations and 2 figures.

ASSOCIATION: none

SUBMITTED: 16May64

ENCL: 00

SUB CODE: ME

NO REF SCV: 002

OTHER: 000

Card 2/2

GRANAT, N. Ye.

[Hygiene during pregnancy] Gigena beremnoi zhenshchiny. 2 ispr.  
isd. Moskva, In-t sanitarnogo prosveshcheniia, 1949. 15 p.  
(Zachnye kursy dlia beremnykh zhenshin, lektsiia 2) (MLRA 7:6)  
(Pregnancy)

GRANAT, N. ~~Ye~~.

Rasskaz vracha (A physician's story).  
Izd. 3-e, ispr. i dop. Moskva, In-t san. prosveshche-  
niia, 1953. 38 p. (B-chka kolkhoznika)

SO: Monthly List of Russian Accessions, Vol. 7, No. 5, August 1954



GRANAT, N.Ye.

Decree of 1754 on the organization of midwife schools in Russia.  
Akush. i gin. no.5:88-91 S-O '54. (MLRA 7:12)

1. Iz Instituta akusherstva i ginekologii (dir. L.G.Stepanov,  
nauchnyy rukovoditel' prof. P.A.Beloshapko) Ministerstva zdrazvo-  
okhraneniya SSSR.

(MIDWIVES,  
hist. of educ. in Russia)

GRANAT, N.Ye.

STEPANOV, L.G.; GRANT, N.Ye.

"Rural feldsher-midwife station." G.F.Konstantinov, I.IA.Bychkov.

Reviewed by L.G.Stepanov, N.E.Granat. Akush. i gin. no.6:87-89

N-D '54.

(MLRA 8:2)

(MEDICINE, RURAL)

(MIDWIVES)

(KONSTANTINOV, G.F.)

GRANAT, N.Ye.

Work of a midwife at a midwife-feldsher station. Sov. med, 18 no.8:  
36-39 Ag '54. (MLRA 7:8)

1. Iz nauchno-issledovatel'skogo instituta akusherstva i ginekologii  
Ministerstva zdavookhraneniya SSSR (dir. L.G.Stepanov, nauchnyy ru-  
voditel' prof. P.A.Beloshapko)  
(PUBLIC HEALTH,  
in Russia, feldsher-midwife stations)

GRANAT, N. Ye.

GRANAT, N. Ye.; STEPANOV, L. G., (Moskva)

Work of a rural midwife. E. Klenitskaia, L. Mel'nikova. Reviewed  
by N. E. Granat, L. G. Stepanov. Fel'd: 1 akush. no. 8:57-60 Ag '55.  
(MIDWIVES) (KLENITSKAIA, E.) (MLBA 8:10)

BARTHEL'S, A.V.; GRANAT, N.Ye. (Moskva)

Physical culture during puerperium. Fel'd. i akush. 21 no.12:21-29  
D '56. (MIRA 10:1)

(PUERPERIUM) (EXERCISE)

GRANAT, Nikolay Yefimovich; BELOSHAPKO, Pavel Andreyevich, red.

[Abortion; materials for lectures and talks] Abort; material dlia  
lektzii i besed. Pod red. P.A. Beloshapko. Moskva, In-t sanitarnogo  
prosveshchenia, 1957. 54 p. (MIRA 11:10)

(ABORTION)

GRANAT N.Ye.  
BULYGINA, Ye.A., starshiy nauchnyy sotrudnik; GRANAT, N.Ye., kandidat  
meditsinskikh nauk; ZHELOKHOVSEVA, I.N., kandidat meditsinskikh  
nauk

The role of a rural district hospital in the organization of  
obstetric services, Sov.zdrav. 16 no.8:29-34 Ag '57. (MLRA 10:10)

1. Iz Nauchno-issledovatel'skogo instituta akusherstva i ginekologii  
(dir. L.G.Stepanov) Ministerstva zdavookhraneniya RSFSR.

(OBSTETRICS

obstetric serv. at general district hosp. in Russia)

(HOSPITALS,

some)

*GRANAT, N. Ye.*  
BODYAZHINA, V.I., prof.; GRANAT, N.Ye., kand.med.nauk (Moskva)

The welfare of women in the U.S.S.R. Sov.med. 21 no.10:45-52 O '57.  
(MATERNAL WELFARE (MIRA 11:1)  
in Russia)



ARKHANGEL'SKIY, Boris Aleksandrovich, zasluzhennyy deyatel' nauki;  
SPERANSKIY, Georgiy Nesterovich, zasluzhennyy deyatel' nauki;  
GRANAT, N.Ye., red.; OSTROVSKAYA, I.M., red.; ZUYEVA, N.K.,  
tekhn.fed.

[Mother and child; school for the young mother] Mat' i ditia;  
shkola molodoi materi. Moskva, Gos.izd-vo med.lit-ry, 1959.  
155 p. (MIRA 12:12)

1. Deystvitel'nyy chlen Akademii meditsinskikh nauk SSSR (for  
Arkhangel'skiy, Speranskiy).  
(PREGNANCY) (INFANTS--CARE AND HYGIENE)

BARTEL'S, A.V.; GRANAT, N.Ye.; NOGINA, O.P.; SALGANNIK, G.M. [deceased];  
SMIRNOV, G.I.; STEPANOV, L.G.; KHANOVA, T.M., red.; YANKOLEVICH,  
Ye.I., red.; GABERLAND, M.I., tekhn.red..

[Lecture course for pregnant women] Kurs lektsii dlia beremennykh  
zhenshchin. Pod red. L.G.Stepanova. Izd.3. Moskva, Medgiz,  
1959. 231 p. (MIRA 12:8)

1. Nauchno-issledovatel'skiy institut akusherstva i ginekologii  
Ministerstva zdavookhraneniya RSFSR (for all except Khanova,  
Yankolevich, Gaberland). 2. Direktor Nauchno-issledovatel'skogo  
instituta akusherstva i ginekologii Ministerstva zdavookhrane-  
niya RSFSR (for Stepanov).

(PRENATAL CARE)

BODYIAZHINA, V.I., prof.; GRANAT, N.Ye., kand.meditsinskikh nauk; OSTROVITYANOVA,  
L.V. (Moskva)

Some problems in the organization of gynecological service. Sov.  
zdrav. 19 no.6:16-20 '60. (MIRA 13:9)  
(GYNECOLOGY)

SHUB, Rafail L'vovich, zasluzhennyy deyatel' nauki Latvyskoy SSR, prof.;  
GRANAT, N.Ye., red.; ZAKHAROVA, A.I., tekhn.red.

[Importance of vitamins and nitrofurans in obstetrics and  
gynecology] Znachenie vitaminov i nitrofuranov v akusherstve  
i ginekologii. Moskva, Medgiz, 1961. 157 p.

(MIRA 15:4)

(VITAMINS)

(FURAN)  
(GYNECOLOGY)

(OBSTETRICS)

BRAUDE, Isaak Leont'yevich [deceased]; PERSIANINOV, Leonid Semenovich.  
Prinimali uchastiye: BRAUDE, A.I., doktor med.nauk; GRANAT, N.Ye.,  
kand.med.nauk; ZHMUR, V.A., prof.; MAKEYEVA, O.V., doktor med.  
nauk; RAFAL'KES, S.B., dotsent. PORAY-KOSHITS, K.V., red.;  
BUL'DYAYEV, N.A., tekhn.red.

[First aid in obstetrical and gynecological pathology] Neotlozhnaia  
pomoshch' pri akushersko-ginekologicheskoi patologii. Moskva,  
Medgiz, 1962. 358 p. (MIRA 15:5)

(FIRST AID IN ILLNESS AND INJURY)  
(OBSTETRICS)

GRANAT, N.Ye., kand.med.nauk; CHERNYAK, L.O., arkhitektor (Moskva)

Standard designs for obstetrics buildings for rural hospitals.  
Sov.zdrav. 21 no.10:72-77 '62. (MIRA 15:10)

1. Iz Instituta akusherstva i ginekologii (dir. - prof. O.V.  
Makeyeva) i Proyektного instituta Ministerstva zdravookhraneniya  
RSFSR (dir. A.A.Zhdanovich).  
(HOSPITALS, GYNECOLOGIC AND OBSTETRIC)

DONIGEVICH, Mikhail Ivanovich; GRANAT, N.Ye., red.; LYUDKOVSKAYA,  
N.I., tekhn. red.

[Organization of obstetrical aid in a rural locality;  
Mordvinian A.S.S.R.] Opyt organizatsii rodovspomozheniia  
v sel'skoi mestnosti; Mordovskaya ASSR, Moskva, Medgiz,  
1963. 118 p. (MIRA 16:7)

(MORDOVIA--OBSTETRICS)

GRANAT, N.Ye.

History of abdominal cesarean section. Med. sostra 22 no.3:  
41-43 Mr'63. (MIRA 16:6)

(CESAREAN SECTION)



MAKEYEVA, O.V., prof., red.; POPOVA, G.F., red.; GRANAT, N.Ye.,  
kand. mekh. nauk, red.

[Woman's health] Zdorov'e zhenshchiny. Moskva, Meditsina,  
1964. 181 p. (MIRA 17:11)

GARMASHEVA, Natal'ya Leonidovna, prof.; GRANAT, N.Ye., red.

[For the woman about the intrauterine development of the  
child] Zhenshchine o vnutriutrobnom razvitii rebenka.  
Moskva, Meditsina, 1965. 23 p. (MIRA 19:1)

GRANAT, S. S.

Granat, S. S. - "Some problems in the realm of measurement and regulation of the wetness of linen for paper," Materialy Tsent. nauch.-issled. in-ta bumazh. prom-sti, Issue 37, 1948, p. 251-73  
— Bibliog: 8 items

So: U-3566, 15 March 53, (Letopis 'Zhurnal 'nykh Statey, No. 13, 1949)

GRANAT, S. S.

36192 Avtomatizatsiya i tekhnicheskii progress proizvodstva. (S primech. red.)  
Bumazh. prom-st', 1949. No. 5. S. 38-42.

S0: Letopsi' Zhrunani' nykh Satey, No. 49, 1949

GRANAT, S.S., glavnyy konstruktor.

Devices for control and measurement and automatic regulators in the wood pulp and paper industry (continuation). Bum.prom. 28 no.7:15-19 J1 '53.  
(MLRA 6:7)

1. Otdel avtomatiki Gosudarstvennogo instituta proyektirovaniya tsellyulozno-bumazhnoy promyshlennosti.  
(Wood-pulp industry)

GRANAT, S.S.

Control and measuring instruments, and automatic control in pulp and paper production. *Изв. пром.* 28 no.12:16-21 D '53. (MIRA 6:12)

1. Glavnyy konstruktor otdela avtomatiki Giprobuma.  
(Wood-pulp industry)

GRANAT, S.S.

Control and measuring instruments and automation in pulp and paper production. *Bum.prom.* 29 no.8:10-13 Ag '54. (MLRA 7:9)

1. Glavnyy konstruktor otdela avtomatiki Giprobuma.  
(Automatic control) (Paper industry) (Pulp industry)

GRAMAT, S.

Instruments for control and measurement and automatic machinery in the production of pulp and paper. P. 30.

SC: East European Accessions List, Vol. 3, No. 9, Sept. 1954, Lib. of Congress



GRANAT, S.S.

~~On the subject of~~

Control and measuring instruments and automation in pulp and paper production. Bum.prom. 30 no.1:8-10 Ja '55. (MLRA 8:3)

1. Glavnyy konstruktor otdela avtomatki Giprobuma.  
(Paper industry)(Wood-pulp industry)

GRANAT, S.S.

Measuring instruments and automatic control in the woodpulp and paper industries. Bum.prom. 31 no.9:7-9 S '56. (MLRA 9:11)

1. Glavnyy konstruktor otdela avtomatiki Giprobuma.  
(Paper industry) (Woodpulp industry) (Automatic control)

*Gramat, S.S.*

BALMASOV, Yevgeniy Yakovlevich; OBRAZTSOV, K.I., retsenzent; GRAMAT, S.S., retsenzent; BABAKIN, B.I., red.; BARANOV, N.A., red.; SARMATSKAYA, G.I., red.izd-va; SHITS, V.P., tekhn.red.

[Automatic control of processes in the manufacture of woodpulp and paper] Avtomaticheskoe regulirovanie protsessov tsellulozno-bumazhnogo proizvodstva. Moskva, Gosleshumizdat, 1955. 248 p.  
(Woodpulp industry) (MIRA 11:6)  
(Paper manufacture) (Automatic control)

GRANAT, S. S.  
GRANAT, S. S., insh.

Means of effecting automation in woodpulp and paper manufacture.  
Bum.prom. 32 no.11:28-29 N '57. (MIRA 11:1)

1.Giprobum.

(Woodpulp industry) (Paper industry)  
(Automatic control)

PREOBRAZHENSKIY, L.N.; GRANAT, S.S.

Prospects and problems of automation in the woodpulp production.  
Bum.prom. 37 no.10:6-8 0 '62. (MIRA 15:11)

1. Otdel avtomatiki Gosudarstvennogo instituta po  
proyektirovaniyu predpriyatiy tsellyuloznoy  
i bumazhnoy promyshlennosti.  
(Woodpulp industry)  
(Automation)

GRANAT, S.S.; BALLEASOV, Ye.Ya., nauchn. red.; POSTNOVA, I.D.,  
red.; SHENDAREVA, L.V., tekhn. red.

[Control of the composition of the paper stock] Regulirova-  
nie kompozitsii bumazhnoi massy. Moskva, TSentr. in-t tekhn.  
informatsii i ekon. issledovaniy po lesnoi, bumazhnoi i de-  
revoobrabatyvaiushchei prom. 1963. 30 p. (MIRA 17:3)

1. Gosudarstvennyy institut po proyektirovaniyu tsellyulozno-  
bumazhnoy promyshlennosti (for Granat).

GRANAT, YE. YE.

Granat, Ye. Ye. "Tissue therapy in children," Trudy VI Vsesoyuz. s'yezda det. vrachey, posvyashch. pamyati prof. Filatova, Moscow, 1948, p. 90-95

SO: U-3264, 10 April 1953, (Letopis 'Zhurnal 'nykh Statey, No. 3, 1949)

GRANAT, YE. YE. (PROF)

PA 13/49T104

USSR/Medicine - Children, Diseases  
Medicine - Organs, Extracts

Mar 48

"Action of Biogenous Stimulants on Children Suffering From Certain Diseases," Prof Ye. Ye. Granat, Clinic of Children's Diseases, Khabarovsk Med Inst, 5 pp

"Vop Ped i Okhran Mater i Det" Vol XVI, No 3

Describes administration of placenta extracts to hypotrophic children.

13/49T104



GRANAT YE. YE.

USSR/Medicine - Immunity  
Medicine - Influenza

Mar/Apr 49

"Medical News" 1 p

"Pediatriya" No 2

Fifth Session of Acad Med Sci convened  
23 - 27 Dec 48 in Moscow. Two problems were  
considered: immunity and influenza. Prof Ye.  
Ye. Granat, Children's Clinic, Khabarovsk Med  
Inst, has completed 25 years of medical,  
pedagogical, and scientific work. First and  
Second Moscow Med Institutes have set up Corre-  
spondence Bureaus to render assistance to their  
graduate doctors.

41/49T82

LC

GRANAT, Ye. Ye.

GRANAT, Ye. Ye.; PROKINA, N. M.

~~PROKINA, N. M.~~  
Lambliasis in Children. Fol'dsher & akush., Moskva No. 2: 38-41 Feb 52.  
(CJML 21:4)

1. Professor for Granat.

KAPCHITS-GUREVICH, H.R.; GRANAT, Ye.Ye., professor, direktor.

Treatment with allilsate of lamblasis in children. Sov.med. 17 no.7:34-  
35 J1 '53. (MLA 6:8)

1. Klinika detskikh bolezney Stalinskogo instituta usovershenstvovaniya  
vrachey. (Garlic--Therapeutic use) (Intestines--Diseases)

GRANAT, Ye. Ye., professor (Stalinak)

Effect of hetero- and homopreparations, processed by V.P. Filatov's method, on the titer of heterophil antibodies. Vrach. delo no. 8:881 (MIRA 10:8) Ag '57.

1. Klinika detskikh bolezney (sav. - professor Ye. Ye. Granat) Institut usovershenstvovaniya vrachey (ANTIGENS AND ANTIBODINS)

G. R. ANAT, Ye, Ye

~~GRANAT. Ye. Ye.~~

Intestinal and hepatic forms of lamiasis in children. Vop. okh. nat.  
i det. 2 no. 4:85-86 J1-Ag '57. (MLMA 10:9)

1. Iz Stalinskogo gosudarstvennogo instituta usovershenstvovaniya  
vrachey.  
(LAMBLIASIS)

USSR / General Problems of Pathology. Transplantation U-2  
of Tissues and Tissue Therapy.

Abs Jour: Ref Zhur-Biol., No 15, 1958, 70731.

Author : ~~Granata Ye. Ye.~~

Inst : Not given.

Title : The Effect of Heterogenic and Homogenic Tissue  
Extracts Processed According to the Filatov Method,  
on the Titer of Heterophilic Antibodies.

Orig Pub: Vrachebn. Delo, 1957, No 8, 881-882.

Abstract: The titer of rabbit heterophilic antibodies in  
agglutination of ram's erythrocytes increases with  
age. Injections of distilled water retarded the  
increase of titer with age in most rabbits. The  
injection of an extract of human placenta produced  
a decrease of titer [titer of heterophilic anti-  
bodies]. A decrease of titer was noted in six

Card 1/2

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R000516520012-9

USSR / General Problems of Pathology. Transplantation U-2  
of Tissues and Tissue Therapy.

Abs Jour: Ref Zhur-Biol., No 15, 1958, 70731.

Abstract: rabbits out of the 11 who had been injected with  
pulverized placenta. Sixteen of the twenty rabbits  
who had been injected with an extract of rabbit  
placenta or had received muscle graft of rabbit  
of rabbit tissue showed an increase in titer of  
heterophilic antibodies. -- Ts. S. Lemberg

Card 2/2

GRANAT, Ye.Ye. prof.

Clinical aspects and etiology of the Schonlein-Henoch disease  
in children. Vop. okh. mat. 1 det. 3 no.5:32-35 S-0 '58  
(MIRA 11:11)

1. Iz kliniki detskikh bolezney (zav. prof. Ye.Ye. Granat)  
Stalinskogo instituta dlya usovershenstvovaniya vrachey.

(CHILDREN--DISEASES)  
(PURPURA (PATHOLOGY))

GRANAT, Ye.Ye.

Titer of heterophil antibodies in healthy and sick children.  
Vop. okh. mat. 1 det. 3 no. 6: 81-82 N-D '58 (MIRA 11:12)

1. Iz Chelyabinskogo meditsinskogo instituta:  
(ANTIGENS AND ANTIBODIES)



GRANAT, Ye.Ye. ; TYURINA, N.S.

Cancer in children. Vop. onk. 5 no.1:94-98 '59. (MIRA 12:3)

1. Iz kliniki detskikh bolezney (zav. - prof. Ye.Ye. Granat)  
Chelyabinskogo meditsinskogo instituta (dir. - prof. G.D. Obrastsov)  
Adres avtorov: g. Chelyabinsk, Meditsinskiy institut.  
(NEOPLASMS, in inf. & child,  
(Rus))

GRANAT, Ye. Ye.; TYURINA, N.S.

Influenza in Chelyabinsk children in 1957. *Pediatrics* 37  
no. 6:87 Je '59. (MIRA 12:9)

1. Iz kafedry detskikh bolezney Chelyabinskogo meditsinskogo  
instituta.

(CHELYABINSK--INFLUENZA)

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B102/B138

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AUTHORS: Antonov, A. V., Granatkin, B. V., Merkul'yev, Yu. A.,  
Smolik, Ch. K.

TITLE: Pulse method study of neutron diffusion and thermalization  
in water and ice in a wide temperature range

PERIODICAL: Atomnaya energiya, v. 12, no. 1, 1962, 22 - 29

TEXT: The method, apparatus and results are described, of the investigation of non-steady neutron diffusion in water and ice at 0.5 - 286°C and down to -196°C. The pulse method used has been described by Dardel

(Phys. Rev, 96, 1245, 1954) and I. M. Frank. The neutrons, from  $T(d,n)He^4$  reactions, were modulated with a repetition frequency of 250 cps at a

pulse duration of 15 μsec. The neutrons were recorded with a  $B^{10}F^3$  counter, the counter pulses were fed to a 20-channel time analyzer (dead time 10 μsec), designed by I. V. Shtranikh, A. Ye. Voronkov, A. M. Volkov and K. P. Dudareva. An apparatus was designed for studying neutron diffusion in water at 0.5, 3, 7, 20, 71, 98, 136, 138, 159, 200, 250 and

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286°C. The following parameters were measured: neutron life (T) and diffusion coefficient (D), coefficient of diffusion cooling (C) non-diffusion correction (d) (N. Sjöstrand. Arkiv fys. 15, 147 (1959)) transport free path ( $\lambda_{tr}$ ), transport cross section ( $\sigma_{tr}$ ), diffusion length (L) and mean cosine of neutron scattering angle ( $\cos \theta$ ). For water at 21°C the following diffusion parameters were measured:  $T = 207 \pm 7 \mu\text{sec}$ ,  $D = (0.35 \pm 0.01) \cdot 10^5 \text{ cm}^2/\text{sec}$ ,  $C-d = (0.04 - 0.01) \cdot 10^5 \text{ cm}^4/\text{sec}$ . The diffusion parameters for ice at -196°C are given in the table. The experimental values were approximated by means of the following formulas:

$$\frac{D(t^\circ\text{C})}{D(21^\circ\text{C})} = (0.934 \pm 0.028) + \\ + (0.289 \pm 0.009) 10^{-2}t + \\ + (0.106 \pm 0.03) 10^{-4}t^2 \quad (5)$$

$$\cos \theta = 1 - \lambda_s / \lambda_{tr} \quad (\lambda_s - \text{scattering mean free path}),$$

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$$\frac{L(t)}{L(22^\circ\text{C})} = \frac{1}{q} \left[ \frac{t+273,1}{204,1} \right]^{1/3} \times$$

$$\times \left[ \frac{1,0614}{1+0,0614 \left[ \frac{t+273,1}{204,1} \right]^{1/3}} \right]^{1/3} \quad (9)$$

$$\frac{(C-d)(t)}{(C-d)(21^\circ\text{C})} = (0,987 \pm 0,098) +$$

$$+ (0,611 \pm 0,031) 10^{-3} t +$$

$$+ (0,348 \pm 0,104) 10^{-3} t^2. \quad (10)$$

$$\varepsilon = \frac{1}{6} \frac{D^2}{C} \frac{\bar{\lambda}_s}{v} \left( 1 + \frac{d \ln \bar{\lambda}_{tr}}{dv} \right) \times$$

$$\times \left( 2 \frac{E_n}{kT} - 3 \right), \quad (11)$$

( $\varepsilon$  - energy transferred by one neutron per collision). The heat-exchange constant  $\gamma = D^2/C$  was  $(3.10 \pm 0.35) \cdot 10^5 \text{ sec}^{-1}$ ,  $\varepsilon = 0.23 \pm 0.07$ . Conclusions: Anisotropy in the angular distribution of scattered neutrons increases with temperature. In water at room temperature neutron thermalization satisfies Dardel's theory (Trans. Roy. Inst. Technol. No. 75, 1954) when the deviation of the neutron temperature from equilibrium is only small. In ice at  $-196^\circ\text{C}$  the neutron gas is in equilibrium with the ice. Equilibrium is established 45 - 75  $\mu\text{sec}$  after slowing down begins. This

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slowing-down time is much greater than in water. The authors thank I. M. Frank for interest, B. V. Makarov, V. M. Gulikov, V. V. Talakvadze, and Ye. A. Velichenkova for assistance. There are 7 figures, 1 table, and 17 references: 3 Soviet and 14 non-Soviet. The four most recent references to English-language publications read as follows: K. Beckurts. Symposium on "In Pile Neutron Spectra and Pulsed Neutrons Methods". Denmark, 1960; D. Hughes et al. Phys. Rev., 119, 872 (1960); D. Hughes, R. Schwarts. Neutron Cross Sections. New York, 1958; K. Rockey, S. Skolnik. Nucl. Sci. Engng, 8, 62 (1960).

SUBMITTED: July 1, 1961

Table

t, °C	Q, c/cm <sup>2</sup>	T, мсек	10 <sup>5</sup> D, см <sup>2</sup> /сек	(C-d), 10 <sup>5</sup> см <sup>2</sup> /сек	L, см	σ <sub>tr</sub> , бари	λ <sub>tr</sub> , см	cos θ
-196	0,917±0,010	215±10	0,095±0,004	0,02±0,01	1,43±0,07	146±6	0,224±0,009	—
—	—	222	0,105±0,004	0,025±0,01	1,53±0,08	132±6	0,248±0,010	0,10±0,05

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ANTONOV, A.V.; GRANATKIN, B.V.; MERKUL'YEV, Yu.A.; PUZANOV, V.V.; SMOLIK,  
Ch.K.

Neutron diffusion for water and ice at temperatures near 0°C and -  
80°C. Atom. energ. 13 no.4:373-374 0 '62. (MIRA 15:9)  
(Neutrons—Scattering)



MEL'NIKOVA, O., arkhitektor; GRANATKIN, G., arkhitektor

Universal four-story industrial building. Prom.stroi.i inzh.soor.  
4 no.1:10-14 Ja-F '62. (MIRA 15:8)  
(Industrial buildings) (Precast concrete construction)

L 22738-66 EPF(n)-2/EWA(h)/EWT(1)/EWT(m)

ACC NR: AP6007959 SOURCE CODE: UR/0089/66/020/002/0164/0165

AUTHORS: Antonov, A. V.; Merkul'yev, Yu. A.; Granatkin, B. V.

ORG: none

TITLE: Temperature dependence of the diffusion parameters of neutrons in water and in ice

SOURCE: <sup>A</sup> Atomnaya energiya, v. 20, no. 2, 1966, 164-165

TOPIC TAGS: neutron diffusion, temperature dependence, water, ~~ice~~, neutron cross section, transport property

ABSTRACT: This is a continuation of earlier work by the authors (Atomnaya energiya v. 12, 22, 1962 and 13, 373, 1962), where they determined the temperature dependence of the diffusion coefficient  $D(t)$  and of the diffusion-cooling coefficient  $C(t)$  of thermal neutrons for water and ice. To reconcile the earlier results with those of W. W. Glendenin (Nucl. Sci. and Engng. v. 18, 351, 1964), the authors used the experimental values of  $D$  in water to calculate, by means of elementary formulas, the values of the transport cross

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section of thermal neutrons and their temperature dependence. They also calculated the temperature dependence of the mean square of the exchange energy for water and for ice, with allowance for the non-diffusion correction of the diffusion coefficient. The calculations show that when water is heated the mean square exchange energy per hydrogen atom increases, thereby increasing the diffusion motion of the molecules in the water and weakening the interaction between the liquid molecules. The reasons for this increase are the weakening of the molecular forces that prevent the exchange of energy between neutrons with increasing temperature, and the fact that the rotational motion of the water molecules approaches the motion of the free rotator. The earlier investigation was based on the assumption that the transport cross section is proportional to the reciprocal square root of the energy, and the present results confirm this assumption. The authors thank I. M. Frank and M. V. Kazarnovskiy for reviewing the article and remarks. Orig. art. has: 2 figures and 2 formulas.

SUB CODE: 20/ SUBM DATE: 25Aug 65/ ORIG REF: 004/ OTH REF: 004

Card 902/2

GRANATMAN, Vsevolod Vladimirovich; KHUTORENKO, I.A., red.

[Logic elements using cold-cathode tubes] Logicheskie elementy na lampakh s kholodnym katodom. Leningrad, 1964.  
23 p. (MIRA 17:9)

AM4017341

BOOK EXPLOITATION

S

Granatman, Vsevolod Vladimirovich; Danilov, Vladimir Ivanovich, Kiryachek, Andrey Yakovlevich

Industrial contactless apparatus with discrete action; a survey (Promy\*shlennaya beskontaktnaya apparature diskretnogo deystviya; obzor), Leningrad, LDNTP, 1963, 102 p. illus., biblio. 4,500 copies printed. (At head of title: Leningradskoye otdeleniye Obshchestva po rasprostraneniyu politicheskikh i nauchny\*kh znaniy RSFSR)

Series Note: Leningradskiy Dom nauchno-tekhnicheskoy propagandy\*. Seriya: Priory\* i elementy\* avtomatiki

TOPIC TAGS: contactless apparatus, automation, magnetic core, automation, magnetic logic element, ferrite transistor logic element, square hysteresis loop

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Ch. I. General principles of contactless relay assemblies - - 5

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LADYZHENSKIY, M.M.; LYUBOMIRSKAYA, S.I.; TANKHILEVICH, V.A.;  
TOMASHEVSKAYA, I.A.; TSIRKEL', M.L.; GRANATMAN, V.V.,  
red.

[Use of TK-3B, TKh-4B, and TKh-5B cold-cathode thyratrons  
in pulse circuits] Opyt primeneniia tiratronov s kholod-  
nym katodom tipov TK-3B, TKh-4B, TKh-5B v impul'snykh  
skhemakh. Leningrad, 1964. 22 p. (MIRA 17:11)

GRANATUROV, G., mayor, master sporta SSSR

Mikhail Osintsev plays in the first line. Starsh.-serzh. no.11:39  
O[i.e. N] '61. (MIRA 15:2)

1. Predsedatel' komiteta po khokkeyu s myachom Federatsii khokkeya  
SSSR.

(Hockey)

**Determination of morphine in opium infusion.** *M. P. Granaturov. Apechnoe Delo 3, No. 1, 33-4 (1954).*—Thirty cc. of the infusion is concd. to 2-3 cc. in a weighed porcelain dish. One g. of freshly calcined CaO and 2-3 cc. H<sub>2</sub>O are added, the contents thoroughly stirred, and 20 cc. more of water is added. The dish is covered and after 30 min. the wt. of the mixt. is brought up with water to 31.2 g. and the mixt. filtered through a dry filter. Further procedure is according to article "Omnopon" in Soviet Pharmacopoeia (VIII or VII). Twenty-five cc. of the filtrate is equiv. to 25 cc. of the infusion. Working with the filtrate results in considerable saving of time and material. *A. S. M.*



GRANATUROV, M.P.; DMITRENKO, M.A.

Quantitative determination of the alkaloids in the *Thermopsis*  
herb. Apt. delo 9 no. 2:48-49 Mr-Apr '60. (MIRA 13:6)  
(ALKALOIDS)

GRANATYUK, P.N.; RADZIVONCHIK, Ye.A.

The medical center in the control of trauma and suppurative diseases.  
Zdrav.Turk. 3 no.6:37-38 N-D '59. (MIRA 13:5)

1. Iz shelesnodoroshney bol'nitsy stantsii Mary, Turkmenistav.  
(RAILROADS--REPAIR SHOPS--HYGIENIC ASPECTS)

GREBTSOV, G.I., kand. ekon. nauk, dots.; SMEKHOV, B.M., kand. ekon. nauk, dots.; SMOLYAR, L.I., starshiy prepodavatel'; GRANBERG, A.G.; GRANBEGYAN, A., kand. ekon. nauk, red.; KONIKOV, L.A., red.; GERASIMOVA, Ye.S., tekhn. red.

[Principles of working out an interbranch balance] Osnovy razrabotki mezhotraslevogo balansa; uchebnoe posobie. [By] G.I. Grebtsov i dr. Moskva, Ekonomizdat, 1962. 278 p. (MIRA 16:3)

1. Vychislitel'nyy tsentr Gosudarstvennogo nauchno-ekonomicheskogo soveta Soveta Ministrov SSSR (for Granberg).  
(Russia—Economic policy)  
(Programming (Electronic computers))

BURSHTEYN, Feliks Isayevich; GUSEV, Vladimir Timofeyevich;  
GRANBERG, A.G., nauchn. red.; KONIKOV, L.A., red.izd-va;  
PONOMAREVA, A.A., tekhn. red.

[What an interbranch balance is] Chto takoe mezhotraslevoi  
balans. Moskva, Ekonomizdat, 1963. 85 p. (MIRA 16:10)  
(Russia—Economic policy)  
(Industrial statistics)